

# PATENT ABSTRACTS OF JAPAN

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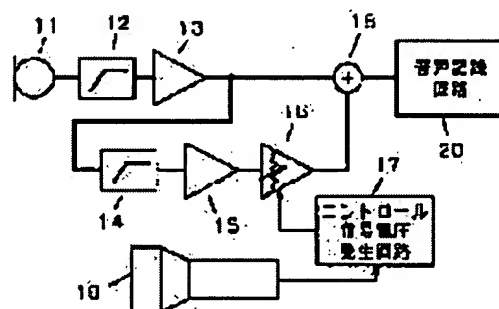
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## (54) VIDEO CAMERA

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an excellent characteristic and a sense of unity in image and sound through zooming to a small sized video camera by solving problems of methods to change directivity of a zoom microphone applied to various electric device and adopting a method where a sound volume and a frequency characteristic of one microphone are changed in matching with a change in a zoom magnification.

**SOLUTION:** A filter 14 cuts low frequency components of an output signal of a 1st amplifier circuit 13 and a 2nd amplifier circuit 15 amplifies an output of the filter 14. An electronic volume 16 receives an output signal of the 2nd amplifier circuit 15. A control signal voltage generating circuit 17 allows the electronic volume 16 to control the reception of the output signal from the 2nd amplifier circuit 15 in response to a zoom ratio through a zoom operation and an adder 18 sums an output signal from the electronic volume 16 and the output signal from the 1st amplifier circuit 13 and provides an output of the sum, which provides a sense of unity between video and audio data.



## LEGAL STATUS

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is carried in the camera which has the zoom function of an image, and relates to the zoom microphone which carries out zoom sound-collecting synchronizing with an image, and a video camera equipped with this.

[0002]

[Description of the Prior Art] In recent years, a noncommercial video camera has remarkable spread. Since these built-in microphones had fixed directivity to most of these noncommercial video cameras having the zoom function, it was deficient in the sense of togetherness of an image and voice.

[0003] The video camera which equipped below with the conventional microphone is explained.

[0004] Conventionally, that the video camera was indicated to be by JP,1-321780,A is known. The video camera is shown in drawing 3. Drawing 3 shows the block diagram of the conventional video camera. In drawing 3, 1 has a zoom function and is the image pick-up section which can photo the image of a photographic subject. 2 is the 1st microphone of extensive directivity used at the time of wide angle photography, and is also called the nondirectional microphone. 3 is the 2nd narrow directivity microphone used at the time of looking-far photography, and is also called the unidirectional microphone. 4 is a mixer into which the voice output signal level of the 1st and 2nd microphones 2 and 3 is changed. Ra and Rb are the variable resistors prepared in the mixer 4. 5 is a control signal-level generating circuit which generates the control signal according to zooming actuation of the image pick-up section 1, and controls a mixer 4. 6 is a voice record circuit.

[0005] About the conventional video camera constituted as mentioned above, the actuation is explained below.

[0006] First, by zoom actuation, the control signal-level generating circuit 5 reads the zoom positional information signal from the image pick-up section 1, and the variable resistors Ra and Rb of a mixer 4 are controlled by the zoom ratio according to a zoom location.

[0007] For example, while the image pick-up section 1 is performing wide angle photography, the control signal-level generating circuit 5 carries out control which raises the resistance of the variable resistor Rb of a mixer 4, attenuates the voice output signal of the 2nd narrow directivity microphone 3 at the time of looking-far photography, and controls the variable resistor Ra of a mixer 4 to output only the voice output signal of the 1st microphone 2 of extensive directivity to the voice record circuit 6.

[0008] Moreover, while the image pick-up section 1 is performing looking-far photography, the control signal-level generating circuit 5 carries out control which raises the resistance of the variable resistor Ra of a mixer 4, attenuates the voice output signal of the 1st microphone 2, and controls the variable resistor Rb of a mixer 4 to output only the voice output signal of the 2nd microphone 3 to the voice record circuit 6.

[0009] Thus, the controlled sound signal is inputted into the voice record circuit 6, and a sound signal is recorded on a record medium etc.

[0010] A directive change of the sound signal inputted into the voice record circuit 6 which controlled

the variable resistors Ra and Rb of a mixer 4 by the zoom ratio according to a zoom location to drawing 4 is shown.

[0011]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional configuration, since two or more microphone units from which directivity differs were required, a video camera could not be miniaturized and it had the trouble of leading to a cost rise.

[0012] This invention solves the above-mentioned conventional trouble, and it aims at offering the video camera which can realize miniaturization of a video camera, and low-pricing.

[0013]

[Means for Solving the Problem] In order to attain this purpose the video camera of this invention The microphone which is the video camera which is equipped with the image pick-up means in which zoom actuation is possible, and controls a sound signal with zoom actuation of said image pick-up means, and collects voice, The 1st filter which reduces low-pass [ of the voice output signal from said microphone ], The 2nd filter which extracts only the high region of the voice output signal from said 1st filter, The level adjustable means which carries out adjustable [ of the level of the voice output signal from said 2nd filter ], It has the control means which controls the level of said level adjustable means according to the zoom actuation in said image pick-up means, and said 1st filter and an addition means to add the output sound signal of said level adjustable means.

[0014] A video camera can be offered by the miniaturization of a video camera, and the low price by changing the gain and frequency characteristics of a voice output signal of a microphone unit by this configuration, without changing directivity.

[0015]

[Embodiment of the Invention] The microphone which is the video camera which invention of a publication equips claims 1 and 2 of this invention with the image pick-up means in which zoom actuation is possible, and controls a sound signal with zoom actuation of said image pick-up means, and collects voice, The 1st filter which reduces low-pass [ of the voice output signal from said microphone ], The 2nd filter which extracts only the high region of the voice output signal from said 1st filter, The level adjustable means which carries out adjustable [ of the level of the voice output signal from said 2nd filter ], It has the control means which controls the level of said level adjustable means according to the zoom actuation in said image pick-up means, and said 1st filter and an addition means to add the output sound signal of said level adjustable means. By this configuration When performing inclusion of an image and voice, an audio output level and frequency characteristics change according to change of the zoom scale factor of a lens. When this change turns into change based on change of human being's vision and an acoustic sense when it reproduces, consequently it reproduces, even if sound volume and the perimeter sound of a photographic subject change according to the zoom of an image and it does not change directivity, it has an operation that the sense of togetherness of sufficient image and voice is acquired.

[0016] Hereafter, the gestalt of operation of this invention is explained using a drawing.

[0017] (Gestalt 1 of operation) Drawing 1 was the block diagram of the video camera of the gestalt of operation of this invention, in drawing 1, the microphone of indirectivity [ 11 ] and 12 are the 1st filter which cuts low-pass [ of the voice output signal from a microphone 11 ], and 3dB omission used the filter which has a property used as 200Hz with the gestalt of this operation. It is the 1st amplifying circuit where 13 amplifies the voice output signal from the 1st filter 12, and the 2nd filter which 14 cuts low-pass [ of the voice output signal from the 1st amplifying circuit 13 ], and extracts only a high region, and the filter with the property that 3dB omission is set to 600Hz was used with the gestalt of this operation. The 2nd amplifying circuit where 15 amplifies the voice output signal from the 2nd filter 14, The electronic volume which is a level adjustable means by which 16 changes the level of the voice output signal from the 2nd amplifying circuit 15, 17 is the control signal-level generating circuit which is the control means which generates the control signal according to zooming actuation of the image pick-up section, and controls the electronic volume 16. When the image pick-up section 19 is in a wide angle photography condition, it controls to make small the output level in the electronic volume 16, and

when the image pick-up section 19 is in a looking-far photography condition, it controls to enlarge the output level in the electronic volume 16. The adder which is an addition means by which 18 adds the voice output signal from the 1st amplifying circuit 13 and the voice output signal from the electronic volume 16, and 19 can perform looking-far photography which is the image pick-up section which is an image pick-up means to photo a photographic subject image, and expands the image under photography, and wide angle photography which reduces an image, and can be changed to the magnitude of a request of the magnitude of the image between a tele edge and a wide angle edge. 20 is a voice record circuit which records the sound signal from an adder unit 18 on record media, such as a magnetic tape.

[0018] Drawing 2 is the property Fig. corresponding to the frequency characteristics of the input sound signal in the electronic volume 16 of the gestalt of this operation showing the level of an output sound signal, and shows the output level at the time of the photography in a tele edge, and the output level at the time of the photography in a wide angle edge, and an output level changes from 1kHz order in the frequency of 10kHz order according to a zoom scale factor.

[0019] About the video camera of the gestalt of this operation constituted as mentioned above, the actuation is explained using drawing 1.

[0020] First, low-pass is cut with the 1st filter 12 with the property that 3dB omission is set to 200Hz in low-pass [ of the voice output signal from a nondirectional microphone 11 ], and this voice output signal is amplified in the 1st amplifying circuit 13. This voice output signal is called the object for wide angle photography. Low-pass is further cut with the 2nd filter 14 with the property that 3dB omission is set to 600Hz in low-pass [ of the voice output signal for this wide angle photography ], and 12dB of voice output signals is amplified in the 2nd amplifying circuit 15. This voice output signal is called the object for looking-far photography. The voice output signal for looking-far photography is inputted into the electronic volume 16.

[0021] The control signal-level generating circuit 17 reads the zoom positional information signal from the image pick-up section 19, and the electronic volume 16 is controlled by zoom actuation in the image pick-up section 19 according to a zoom ratio. For example, at the time of wide angle photography, it controls to reduce the level in the electronic volume 16 so that the voice output signal of the 2nd amplifying circuit 15 may be attenuated as a wide angle edge is approached, and it controls so that the level in a wide angle edge becomes the lowest. On the other hand, at the time of looking-far photography, the level in the electronic volume 16 is controlled to make it go up as a tele edge is approached to pass the voice output signal of the 2nd amplifying circuit 15, and it controls so that the level in a tele edge becomes the highest. The level control of the output sound signal from such electronic volume 16 was clearly shown in the property Fig. of drawing 2.

[0022] And the voice output signal for the wide angle photography from the 1st amplifying circuit 13 and the voice output signal of the electronic volume 16 are added with an adder 18, only the voice output signal for wide angle photography in the time of wide angle photography is added, and the voice output signal for wide angle photography in the time of looking-far photography and the voice output signal for looking-far photography are inputted into the voice record circuit 20 for it.

[0023] According to the gestalt of this operation, the voice output signal for looking-far photography is made to increase by 12dB to the voice output signal for wide angle photography in the 2nd amplifying circuit 15 as mentioned above. By giving the property which cuts low-pass with the 2nd filter 14 further for looking-far photography, controlling the sound signal for looking-far photography by the electronic volume 16, and adding with an adder 18 from the 1st filter 12 for wide angle photography the frequency characteristics of drawing 2 -- like -- the time of wide angle photography -- receiving -- the time of looking-far photography -- the crown -- the sensibility of a region and frequency characteristics go up, if a zoom is operated to looking-far photography, the clear feeling to a perimeter noise will improve, and the effectiveness which zoomed in distant voice is acquired. That is, even if sound volume and the perimeter sound of a photographic subject change according to the zoom of an image and it does not change directivity, the sense of togetherness of sufficient image and voice can be acquired.

[0024]

[Effect of the Invention] As mentioned above, this invention is one microphone unit and the outstanding

effectiveness that sound volume and the perimeter sound of a photographic subject change according to the zoom of an image, and the sense of togetherness of sufficient image and voice is acquired by the approach of changing an audio output level and frequency characteristics according to change of the zoom scale factor of a lens is acquired.

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CLAIMS

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[Claim(s)]

[Claim 1] The microphone which is the video camera which is equipped with the image pick-up means in which zoom actuation is possible, and controls a sound signal with zoom actuation of said image pick-up means, and collects voice, The 1st filter which reduces low-pass [ of the voice output signal from said microphone ], The 2nd filter which extracts only the high region of the voice output signal from said 1st filter, The level adjustable means which carries out adjustable [ of the level of the voice output signal from said 2nd filter ], The video camera characterized by having the control means which controls the level of said level adjustable means according to the zoom actuation in said image pick-up means, and said 1st filter and an addition means to add the output sound signal of said level adjustable means.

[Claim 2] The microphone which is the video camera which is equipped with the image pick-up means in which zoom actuation is possible, and controls a sound signal with zoom actuation of said image pick-up means, and collects voice, The 1st filter which reduces low-pass [ of the voice output signal from said microphone ], The 2nd filter which extracts only the high region of the voice output signal from said 1st filter, The level adjustable means which carries out adjustable [ of the level of the voice output signal from said 2nd filter ], The control means which controls the level of said level adjustable means according to the zoom actuation in said image pick-up means, It has said 1st filter and an addition means to add the output sound signal of said level adjustable means. Said control means The video camera characterized by controlling to make small the output level in said level adjustable means when said image pick-up means is in a wide angle photography condition, and controlling to enlarge the output level in said level adjustable means when said image pick-up means is in a looking-far photography condition.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The block diagram of the video camera in the gestalt of operation of this invention

[Drawing 2] The frequency-characteristics Fig. for explanation of the video camera in the gestalt 1 of this operation of operation

[Drawing 3] The block diagram of the conventional video camera

[Drawing 4] The directive variation diagram for explanation of the conventional video camera of operation

[Description of Notations]

11 Indirectional Microphone

12 1st Filter

13 1st Amplifying Circuit

14 2nd Filter

15 2nd Amplifying Circuit

16 Electronic Volume

17 Control Signal-Level Generating Circuit

18 Adder

19 Image Pick-up Section

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[Translation done.]



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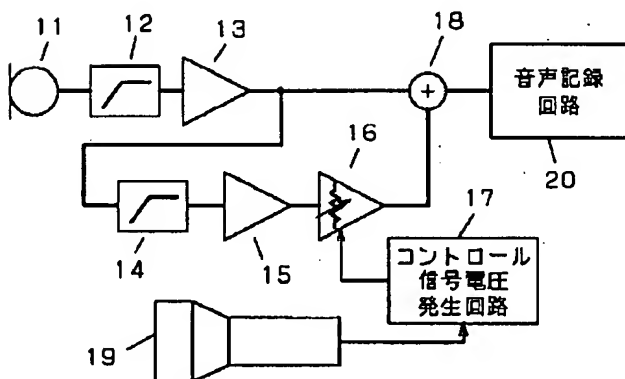
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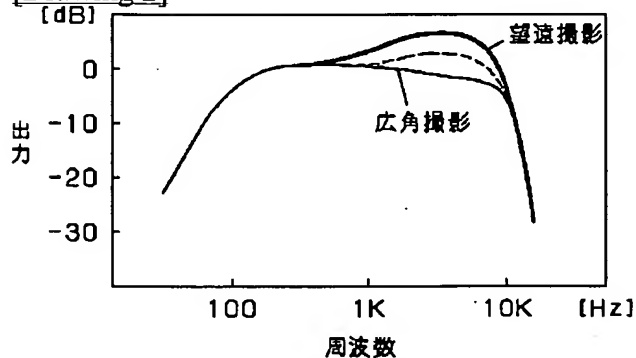
## DRAWINGS

[Drawing 1]

- 11 無指向性マイクロホン
- 12 第1のフィルタ
- 13 第1の増幅回路
- 14 第2のフィルタ
- 15 第2の増幅回路
- 16 電子ボリューム
- 18 加算器
- 19 撮像部

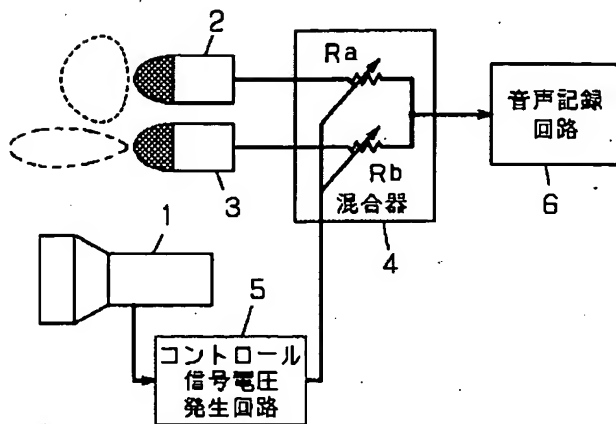


[Drawing 2]

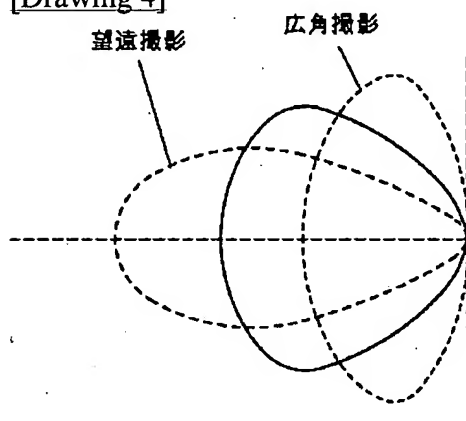


[Drawing 3]

- 2 広指向性マイクロホン  
3 狭指向性マイクロホン



[Drawing 4]



[Translation done.]